Winter

2013

BAD RIVER NATURAL RESOURCE

Common Ground

Part IV: MINING & WATER

Above is a picture of the wetlands and streams south of the Penokee Hills. Photo taken by Pete Rasmussen of Moving Water Photography

Between 1954 and 1984, the consumption of water by the iron mining industry in the U.S. rose over sevenfold. This dramatic shift in water requirements was due to a fundamental change in the iron industry: a transition from natural (or "direct shipping") ores that had largely been exploited to the remaining taconite (low-grade iron). Modern metal mines, such as an open-pit taconite mine, can also be expected to generate waste on the scale of tens-of-millions to billions of tons. In addition, the disposal of mine wastes can disturb thousands of acres of land. When taken together, these elements reveal the potential for modern mining to affect local water resources through site development, the mine process, and pollution from wastes. I'll cover each of these briefly in an attempt to introduce the various mechanisms by which mining can impact aquatic systems. The accompanying figure, on page 3, also provides some examples of how mine pit development and the filling of waterways can result in a chain of effects on local water resources.

In order to understand how mining can impact water resources, we first have to consider the ecological function of an intact landscape. Presently, the area proposed for mining by Gogebic Taconite is covered by highland forest and headwater wetlands which are essential

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Part IV: MINING & WATER

(Continued from front page)

By Cyrus Hester, Bad River Environmental Program

to maintaining the flow, temperature, and chemistry of the cold- and cool-water streams in the area. Research has shown that headwater wetlands sustain cool flow during periods of low water levels; when high water temperatures could otherwise threaten the survival of aquatic vegetation, invertebrates, amphibians, and fish. In fact, 30-70% of the inputs to stream water can originate from groundwater-fed wetlands. Those wetlands also provide essential habitat for microorganisms, filter pollution in runoff, and supply nutrients downstream. The loss of these ecosystem services is perhaps enough to make one believe that the greatest impact of mining on water resources is the very removal or disturbance of headwater wetlands and tributaries. Indeed, that may be so. Such impacts are also often taken for granted.

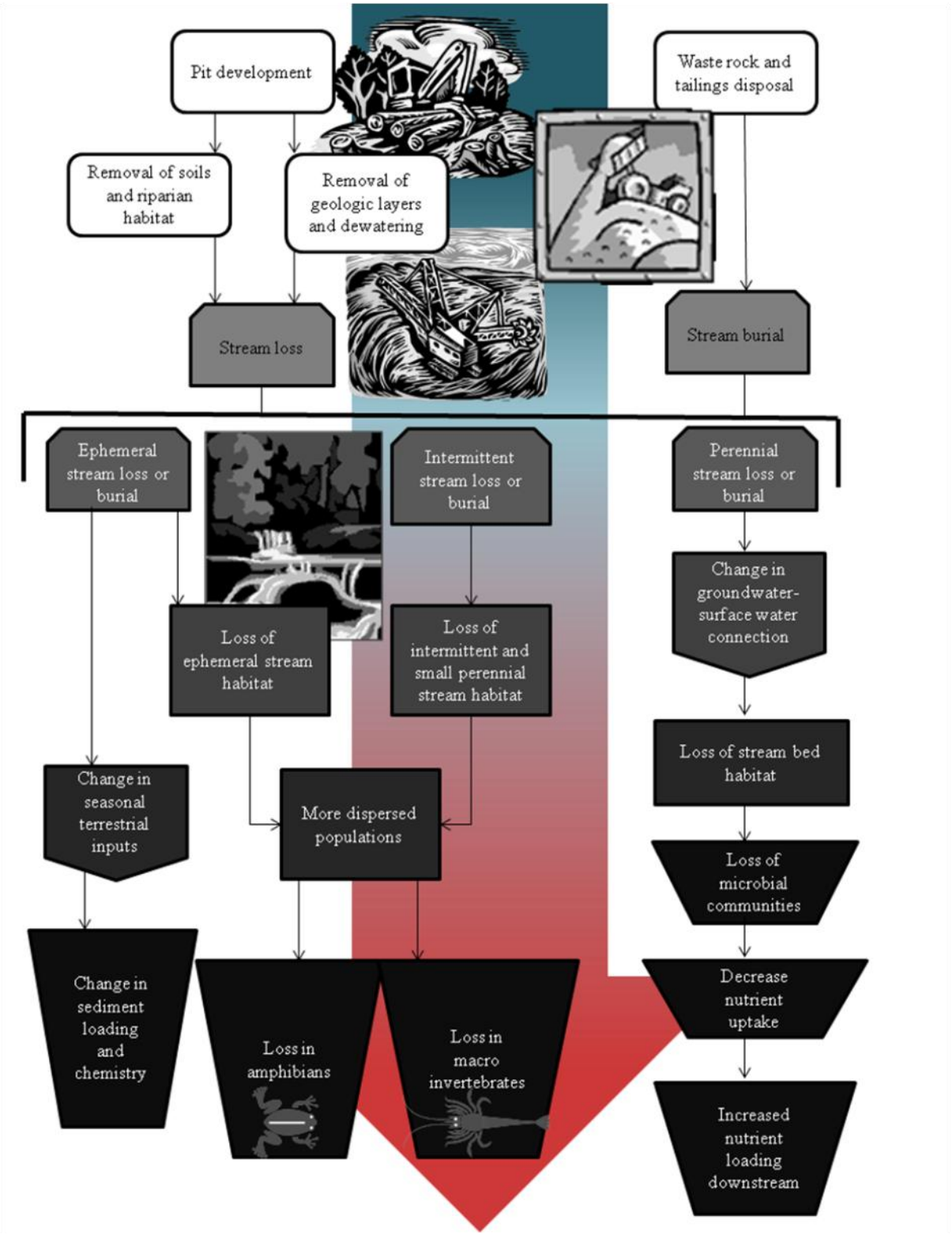
Land clearing and stream diversion are among the first activities for mine site development. In addition, during the life of mining operations, water must be pumped to keep the site dry and permit access to any ore lying beneath the water table. This "dewatering" employs interceptor wells to withdraw groundwater and create a cone of depression; the size and shape of which is contingent upon the permeability of local geology. The presence of rocks and soils that facilitate water movement, to include bedrock fractures, can result in the draining of wetlands, small streams, and residential wells in adjacent areas. As the mine operator extracts the ore, and associated rock, wastes are typically stockpiled near the mine pit (though in-pit disposal is common in strip mines). In the case of Gogebic Taconite, it is estimated that first phase of the project will result in something on the order of 400 million cubic yards of waste rock to be stored in the water- and wetland-rich shadow of the Penokee Hills. In addition to direct land disturbance, waste storage, and dewatering, mining can increase the rate of erosion and sedimentation to levels that are much higher than natural landforms. Overall, the physical development of a mine results in significant and numerous changes to the water resources of an affected area.

In addition to the direct effects of mine development, operations at the mine site can also have implications for local water resources. Water is relied heavily upon for dust control and beneficiation (i.e. concentration of diffuse ore into marketable products). The beneficiation process employs sequential milling to reduce ore to a consistency of fine powder (0.44 microns or about half the diameter of a human hair). This process typically occurs in a liquid medium, one reason why the chemistry of mine water is highly dependent on the geochemistry of the ore body and surrounding geology. According to the EPA, mining processes may require 600-7,000 gallons of water per ton of iron concentrate produced, depending on the beneficiation method. That means somewhere between 480 million and 56 billion gallons of water may be needed each year for Gogebic Taconite to produce its estimate 8 million annual tons of taconite. At existing iron mines, the majority of this operational water comes from tailings thickener overflow, but must originally be drawn from a geological, surficial, or municipal source. Tailings are the fine-grained waste product of the beneficiation process and are made up of process water, milling or beneficiation reagents, and residual minerals that were not extracted. With evidence indicating that sulfides are present in at least one layer of the iron formation, a prospective mine operator will have to be extremely vigilant when considering how to dispose of their tailings and waste water or risk the contamination of surface and groundwater in the area.

Leaching from weathering waste rock, saturated tailings, and mine pit walls are three common forms of mining pollution that can affect surface and ground-water. Depending on the level of pollutants and the potential for exposure, some contaminants can pose a risk to plants, animals, and people. Recurring types of mine-related pollution include acid mine drainage, metal leaching, salinity, and an increase in nitrogen compounds; the last due to the incomplete combustion of blasting reagents. Surface and groundwater can transport these pollutants off-site if not adequately predicted, mitigated, and prevented. Wind transport is another potential mechanism for transporting some pollutants, particularly for smaller particles. It is worth remembering that mining pollution differs from industrial pollution in that undesirable or unexpected by-products of industry tend to be short-lived and generated only as long as the site is operating. Water pollution from mining operations can continue long after the mine is shut down and the resource exhausted.

Over twenty years ago, the Lake Superior Binational Forum began its vision statement with the words: "Water is life, and the quality of water determines the quality of life." As has been stated repeated in the past years, modern metallic mining is an energy-, land-, and water-intensive process. The potential impacts are numerous and lasting. Land managers, communities, and mining engineers must consider the direct, indirect, and cumulative effects of such projects to local water resources and the quality of life they provide for.

Possible Effects Resulting from Mine Pit Development & Filling of Waterways



Spring is Just around the Corner…

By Lacey Hill, Wildlife/ GIS Specialist

Spring is just around the corner… Courtship and mating activities have begun. You may be hearing the courtship song of the Black-capped chickadees or the Northern Cardinals. In the weeks to come we can start expecting to hear and see more wildlife. The maple sap will begin to flow… Ducks, geese, and other migratory birds will start to arrive. With all the activity in the spring there will also be more wildlife appearing close to home. To some people a sign of spring may be the smell of a skunk in the front yard in the early morning hours…

Above is a maple tree that was tapped for maple sugar this year. Picture was taken by Daniel Wiggins.

Skunks are omnivores, meaning that they will eat almost anything that they come in contact with. For that reason skunks can be beneficial to have around because they consume insects and rodents that can be found around your yard. If you have dogs, I can understand why you may not want them near your home. Here are some steps you can take to avoid skunks taking up residence in your yard:

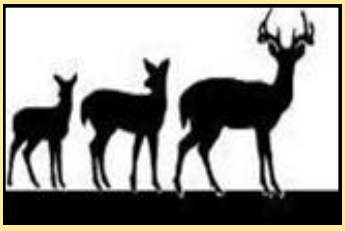
1. Remove possible shelter sites. Walk around your home and make sure all possible holes that a skunk could get into are sealed. This includes other buildings around your yard as well. Make sure that there are no animals currently residing in the hole before sealing it!
2. Do not leave cat or dog food unattended outside. Not only with this draw skunks around but it will also draw other wildlife.
3. Store garbage and food waste in a sealable container and away from areas easily accessible to wildlife.

If the above measures don't work and you want the skunk out of your yard, trapping is the recommended method for removal. Some of the local stores sell some fairly inexpensive live traps. Make sure to check traps often! If you do get a skunk in the trap, approach the trap slowly and cover the trap with a heavy cloth, blanket or tarp. It is possible to transport a skunk without it spraying. If you do happen to get sprayed or your pet gets sprayed there are many different at-home "recipes" for skunk odor. You may have to go through a trial and error period before learning what works best!

Another frequent spring time visitor may be the black bear. Bird feeders and garbage often draw bears close to homes in the spring time. You may have to get creative in figuring out how to keep bears away from your bird feeders and garbage bins! After having my bird feeders smashed multiple times I now have rigged a pulley system to keep my bird feeders high out of reach. Just remember if you happen to have an unwanted visitor this spring look around and see what may be drawing them close to your home. Sometimes little adjustments can go a long way!

Deer Head Collection Summary

By Lacey Hill, Wildlife/ GIS Specialist



This year very few people participated in the deer head collection. For the last two year the BRNRD has been collecting heads from already harvested deer in order to collect age, sex, and health information from the animals. Every head that was submitted was also sent in to get tested for chronic wasting disease, which they all came back negative. With each head submitted the person's name is then entered into a drawing. This last year's drawing was for a trail camera and the winner was Ben Basley. I would like to thank everyone that participated. Stay tuned this next summer for more details about the next head collection drawing.

Feral Cats and their effects on Wildlife: What should we do about Feral Cats on the Reservation?

By Lacey Hill, Wildlife/ GIS Specialist

4 Steps Lead To Successful Nuisance Wildlife Control:

By John Patrick, Conservation Warden

Spring is here! The warmer weather brings all types of outdoor action. There will be more animals moving around, most of which will be looking for food. Nuisance animal complaints are most frequent during spring and fall seasons. Animals like bears, raccoons, and skunks are on the lookout for any easy accessible food and are sometimes simply curious.

1. Correctly identify the species causing the problem. (*Once we know what kind of animal it is we can plan on appropriate ways to capture the animal for relocation.*)
2. Alter the habitat, if possible, to make the area less attractive to the wildlife pest. (*This could mean keeping food waste unavailable for the animal to smell.*)
3. Use a control method appropriate to the location, time of year, and other environmental conditions. (*The most commonly used methods for controlling nuisance wildlife around homes and gardens include exclusion, habitat modification, repellents, traps and frightening methods.*)
4. Monitor the site for re-infestation in order to determine if additional control is necessary.

In any case, contact the Bad River Natural Resources Department and the Bad River Conservation Officer(s) to assist in any nuisance animal issues.

The modern day domestic cat that we all know and most love is thought to be a decedent of the African domestic cat. It is currently recognized as its own species, Felis catus. Cats were domesticated around 4000 years ago by the Egyptians to control pests around food supplies. Today the domestic cat is found in just about every corner of the globe with an estimate of 600 million cats worldwide and 148-188 million found in the United States alone![2]

Worldwide there is a serious problem with free ranging domestic cats. These cats can either be pets that are indoor/outdoor and allowed to come and go as they please or un-owned feral cats. Either way cats are having a major impact on wildlife. A study was recently published that announces outdoor cats at the "single greatest source of human-caused mortality for birds and mammals."[1] This study estimated that annual impact of free-ranging cats to be 1.4 – 3.7 billion bird mortalities and 6.9-20.7 billion mammal mortalities, and that is just in the United States!

In 2008, cats were recognized by the International Union of for the Conservation of Nature as the "world's worst invasive species". They have been documented as being responsible for numerous extinctions of wildlife.

So the question is: Are there free-ranging domestic cats on the Bad River Reservation? The answer is yes. So what should we do about it? Some people are in support of the TNR (trap-neuter-release) programs. These programs do not reduce the problem however. Bad River already has a leash law ordinance on dogs… should this be extended to cats? A leash law on cats may sound silly, but even a well-fed, well taken care of cat are still known to kill wildlife when given the opportunity outside. Then what to do about the un-owned cats wandering around? Local shelters fill up and are often not able to take in feral cats.

If you are interested in learning more about this topic, I have included links for additional information in this article. I will also soon be posting more information on this topic on the tribe's website. If you currently have a feral cat problem please contact John Patrick, Tribal Conservation Officer, at 715-292-7822.

Links for more information:

http://joomla.wildlife.org/index.php?option=com_content&task=view&id=845%20

http://www.abcbirds.org/newsandreports/releases/130129.html

http://www.abcbirds.org/abcprograms/policy/cats/pdf/Loss_et_al_2013.pdf

[1]*Loss S.R., Will T., and Marra P.P. 2013. The impact of free-ranging domestic cats on wildlife of the United States. Nature Communications. DOI:10.1038/ncomms2380.*

[2]*The Wildlife Society. 2011. Ecological Impacts of Feral Cats. http://joomla.wildlife.org/index.php?option=com_content&task=view&id=845%20. Accessed March 13th 2012.*

The Restoration of "Coaster" Brook Trout in Graveyard Creek

By Tim Wilson-Fishery Specialist

The "coaster" brook trout (*Salvelinus fontinalis*) was once abundant across the Lake Superior basin. Over exploitation and gradual destruction of suitable trout habitat, combined with the competition from introduced species like the pacific salmon, caused coaster populations to plummet and today only a few small remnant populations persist in the Lake Superior basin.

A local stream that has lost its coaster brook trout population is Graveyard Creek, and restoring the stream's coaster brook trout population has been an ongoing effort for the Natural Resources Department. A Rehabilitation Plan to restore coaster brook trout to Graveyard Creek was established in 2001, and the creek is one of five study streams identified in the Wisconsin Lake Superior Basin Brook Trout Plan. Supporting recovery, the Wisconsin Department of Natural Resources changed the sport angling regulations for non-tribal members to permit only catch and release of brook trout on Graveyard Creek. The stream's fish community has been described and the stream is surveyed annually by the Tribe's fisheries staff to monitor the resident brook trout population. Past projects, funded by the U.S. Fish and Wildlife Service and the Natural Resource Conservation Service, assisted in the restoration of the creek by removing debris at the creek mouth and beaver control efforts. Natural Resource Conservation Service funds have also assisted in stream channel restoration on sections of the creek.

Fisheries staff removing a stream blockage on Graveyard Creek. Photo by Ed Leoso, Fisheries Technician.

These previous projects began the restoration of Graveyard Creek, but excessive stream braiding, sediment loading, and limited spawning habitat were still hindering the recovery of coaster brook trout in the stream. In the fall of 2011, the Tribe was awarded a grant from the Great Lakes Basin Fish Habitat Partnership to resolve these issues. During the 2012 field season, restoration began with the sequential, upstream removal of abandoned, sediment-laden beaver dams. Then, the primary creek channel was further maintained by hand-installing brush bundles at excessively braided sites to force the stream into a single channel. Washed gravel was installed by hand in three locations to create new spawning areas. During the 2013 field season, any damaged brush bundles will be repaired or replaced to keep the stream in a single channel, wooden fish structures will be placed in the stream to increase cover, and another spawning area will be created.

Washed gravel placed in Graveyard Creek to create brook trout spawning habitat. Photo by Tim Wilson, Fisheries Specialist.

By improving connectivity between the creek and Lake Superior, restoring traditional stream flow, and increasing brook trout habitat, the current restoration project on Graveyard Creek will hopefully facilitate the restoration of both resident and coaster brook trout populations on Tribal lands. If you have any questions regarding this project or would like more information, contact Ed Leoso, Tribal Fisheries Technician or Tim Wilson, Tribal Fisheries Specialist at (715) 682-7123.

E. coli Monitoring in the Bad River: Our Results and Future Plans

By: Naomi Tillison, Water Resources Specialist

The Bad River Natural Resources Department (BRNRD) initiated E. coli monitoring in 2001 at surface water locations distributed throughout the Bad River Watershed. This monitoring is typically conducted on a monthly basis, primarily during the open water season. E. coli is monitored as an indicator organism for fecal contamination. Its presence in streams suggests that pathogenic microorganisms might also be present and that swimming might be a health risk (U.S. EPA, 2012). Sources of fecal contamination to surface waters include wastewater treatment plants, on-site septic systems, domestic and wild animal manure, and storm runoff (U.S. EPA, 2012).

Water samples are collected from 6 sites along the Bad River, including 2 sites located downstream of the Tribe's Wastewater Treatment Plant (WWTP). The data was compared to the Tribe's E. coli standard for a single sample (235 CFU/100 mL). Out of the 180 samples collected at these 6 sites between October 2007 through June 2012, only 1 sample exceeded the Tribe's E. coli criteria. This exceedance occurred at the Elmhoist Road crossing, a site located upstream of the Tribe's WWTP discharge. During the same timeframe, elevated E. coli concentrations were also documented in the Marengo River, which empties into the Bad River upstream of the Elmhoist Road crossing. Elevated E. coli concentrations measured in the rivers and streams tend to be associated with runoff events. Figure 1 provides more information on E. coli concentrations measured upstream in the watershed.

Starting in July 2011, the BRNRD expanded the E. coli monitoring to tribal beaches, through a Chequamegon Bay Area Partnership* project funded by the Great Lakes Restoration Initiative. Two beaches bordering the mouth of the Bad River were monitored on a weekly basis between July and October 2011 and May through July 2012. At each site, the E. coli concentration exceeded the Tribe's standard once (one associated with the large storm event in June 2012); both of these exceedances corresponded with elevated E. coli levels measured upstream in the Marengo River.

Elevated E. coli concentrations were measured in June 2012 at the mouth of the Bad River (on the east side) associated with the large storm event.

Our data shows that non-point source pollution is occurring in the watershed. To address these issues, the BRNRD has collaborated with partners to implement projects that improve land management while resolving water quality impacts. One example is partnering with the Bad River Watershed Association and others to develop of a Marengo River Watershed Action Plan, a plan recently approved by the U.S. EPA. Projects aligned with this plan are already being implemented, improving watershed health.

We'll continue monitoring the health of surface waters throughout the watershed and expand our beach monitoring and assessment program in 2013. We'll be hiring an additional staff member to help us administer our beach project. And we'll be holding a public meeting on April 30, 2013, at 5:00 p.m. at the Bad River Casino and Convention Center to discuss our monitoring plan for coastal recreation waters and solicit community input. More information about this public comment opportunity is provided on the Tribe's webpage (www.badriver-nsn.gov).

*Chequamegon Bay Area Partnership: http://www.northland.edu/cbap.htm

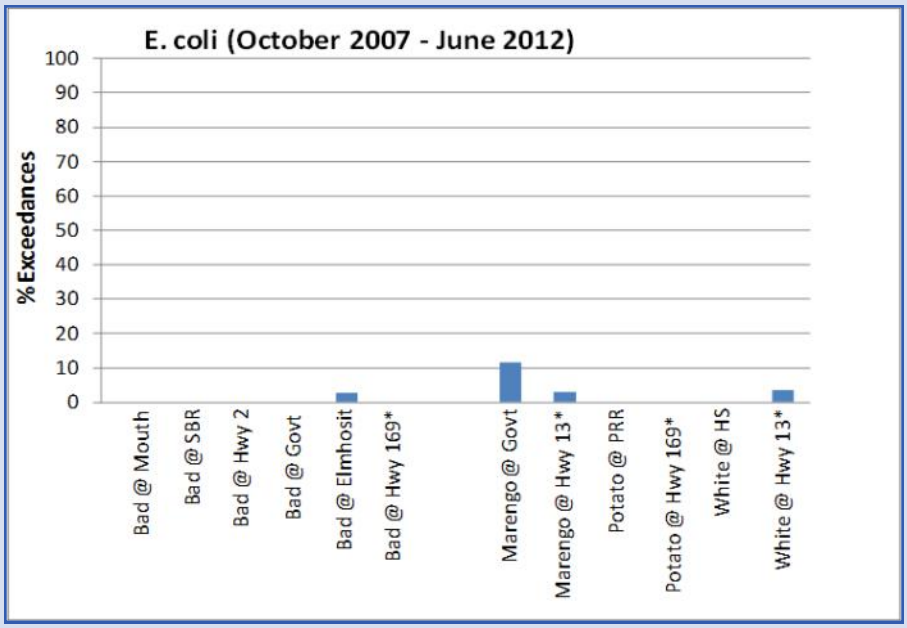
**Source: U.S. EPA, March 2012 (Last Updated). 5.11 Fecal Bacteria. Washington, D.C. Accessed: March 1, 2013. http://water.epa.gov/type/rsl/monitoring/vms511.cfm

E. coli Monitoring in the Bad River: Our Results and Future Plans

(Continued from page 7)

By: Naomi Tillison, Water Resources Specialist

Figure 1: Between October 2007 and June 2012, 385 samples were collected from these 12 monitoring sites and analyzed for E. coli concentrations. 8 of these samples had elevated concentrations exceeding the Tribe's E. coli criterion, and the majority (or 5) of these exceedances occurred at the most downstream Marengo River site (Marengo @ Govt). All the samples collected at the two Bad River sites located downstream of the Tribe's wastewater treatment plant discharge met the E. coli criterion.



Abandoned Wells: *Why They Should be Properly Closed*

By Ed Kolodziejski– Water Resources Technician/ Lab Coordinator

This year the Bad River Water Resources Program plans to properly abandon five wells within the northern portion of the Reservation: three located near the Bad River and two located east of New Odanah. The Water Resources Program will be collaborating with landowners to properly close these wells.

The following information is from a Wisconsin DNR publication discussing well abandonment (PUB-DG-016 2007): Unused and improperly abandoned wells are a significant threat to groundwater quality. If not properly filled with impermeable materials (commonly sodium bentonite or cement grout), abandoned wells can directly channel contaminated surface or soil water into the groundwater aquifers. Water that gets into abandoned wells bypass the purifying action that normally takes place in the upper layers of the soil. Many thousands of improperly abandoned wells are threatening the groundwater in Wisconsin.

How improperly abandoned wells can threaten groundwater

1. Contaminated surface water can enter a well if the casing pipe does not extend high enough above the ground surface and the well cap has been broken or removed; or if there are cracks or holes in the casing due to damage or deterioration with age.
2. Contaminated surface water can seep down along the casing pipe of an improperly abandoned well.
3. Open wells offer tempting disposal receptacles for liquid and solid wastes (such as used motor oil). The disposal of any pollutant or wastewater in a well is prohibited by State Codes.

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Abandoned Wells: *Why They Should be Properly Closed* *(Continued from page 8)*

By Ed Kolodziejski- Water Resources Technician/ Lab Coordinator

Above is an example of an improperly abandoned well that has been allowed to deteriorate to a degree that water is leaking near ground level. During time of flood it could allow contaminants to get into the drinking water aquifer.

4. Large-diameter open wells pose safety hazards for small children and animals. For example, there was an improperly abandoned well on the Bad River Reservation that was down into a cement 'box' that was about 8' underground. Over the years this well filled with water, and if anyone were to fall in, it would be quite easy to drown as there was a small opening enough for a person to get in and all sorts of pipes, pumps and such to get caught on.

In 1996, the Bad River Natural Resource Department, began a Well Abandonment Project, partially funded by the Natural Resource Conservation Service (NRCS). Of the 50 confirmed and identified improperly abandoned wells known by the Bad River Water Resources Program, 48 of them have been properly closed. The method used by the Water Resources Program to close these wells is to seal up the well casing with sodium bentonite, a type of clay, native to the western United States. When exposed to water the dried bentonite chips will absorb and expand forming an impermeable barrier that will function even if the well casing were to corrode completely, which it will eventually do over time. As a measure of safety all exposed well casings will also be cut down to below grade and buried. In the case of the cement 'box' well mentioned earlier, the space was collapsed using earth moving equipment and then buried so that no one could fall in and be injured.

If you have questions or have information about locations of improperly abandoned wells you can contact Edward Kolodziejski at the Bad River Natural Resource Department. Phone number: 715-682-7123 x1565 Email: wrtech@badriver-nsn.gov.

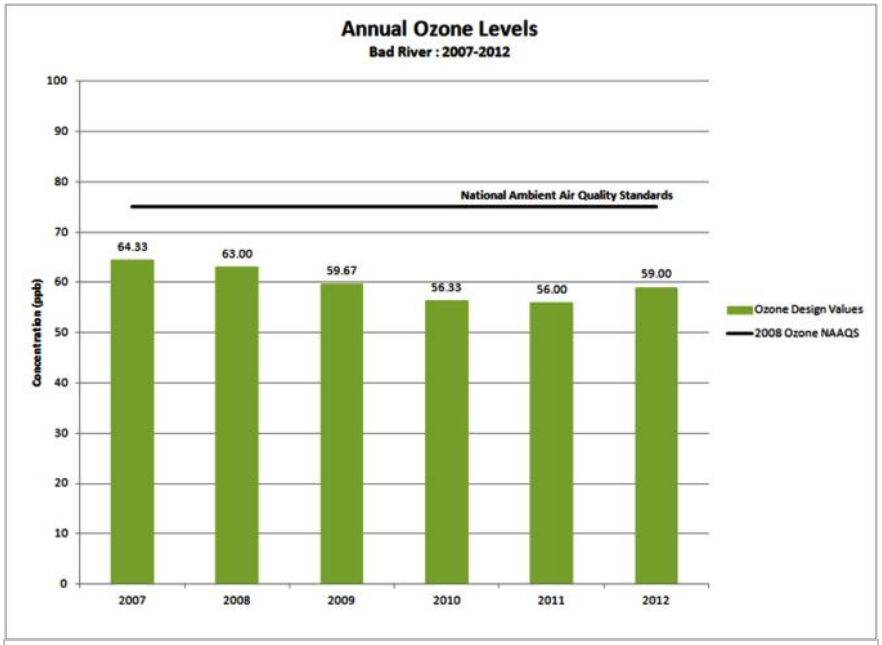
Tribal Realty Update

By Marge Lemieux-Realty Specialist

- In January, 2013 new leasing regulations went into effect. All tribes must update their present lease documents to confirm to these new regulations. Several tribes had a meeting at the Bureau of Indian Affairs (BIA), in February of this year, to discuss the new regulations and how each tribe's present leases can be modified to conform. However, the federal government was also going to send the BIA a new format of the new leases that the Tribes could base their leases on. The BIA hasn't received this new format yet. I recently met with Pam Vendeventer, BIA Realty Specialist, and we will be putting together a new lease format for the Bad River Tribe that we believe can be approved. The Tribal Attorney will review and comment on it where it will then move on to the Tribal Council for final review and approval.
- In addition, our office received word that our funding is going to be reduced due to "budget woes" in Washington. The BIA has had to downsize their staff with early retirement packages, in which the Tribe's reality funding will be reduced by 5% this year and an additional 9% the following year. Many Tribal Realty Programs throughout Indian Country are already minimally funded by the BIA, so this is discouraging news. The President and Senate need to come together on funding as the effects are being felt throughout the U.S.
- My office has also been currently updating fire numbers that are assigned to each business and residence within the Tribe, which will further aide in distinguishing resident locations, and assist in mail and emergency response. I didn't realize the job this would turn out to be; while fire numbers will remain the same, people are often moving. We have separated them alphabetically by road, by fire number in numeric order, and resident's name. This will take time to update and there are many programs, departments, and agencies that will benefit from this data once it is finished.
- A letter was written by the Realty Office, signed by the Tribal Chairman, and was sent to the BIA Superintendent, on March 1, 2013. The purpose of this letter was, in conjunction with other tribes, requesting that the liens on the fractioned parcels purchased by the BIA on behalf of the Bad River Tribe, and as mandated by the Indian Land Consolidation Act, now be waived. It is really not realistic that these liens remain in place. It is projected that at the rate we are repaying the liens since the Land Consolidation Project was put in place in 1999 that it would take the Tribe another 2100 years to repay what we now owe.

Mowing Down Air Quality: Effects of PAHs

By Nathan Kilger- Air Quality Specialist



Above is the annual ozone levels for Bad River from 2007-2012. This graph was created by the Bad River NRD using the Tribe's compiled ozone data combined with the 2008 National Ambient Air Quality Standard.

Polycyclic aromatic hydrocarbons. I have to pause a second to make sure I pronounce that name correctly. Otherwise, I just use the acronym: PAHs.

PAHs are everywhere, there's no escape since they help give objects a scent. That delicious pork chop on the grill is emitting PAHs. And the banana on the kitchen counter. So is the smell of a freshly-cut lawn (I actually like mowing the lawn just so I can get a whiff of the cut grass).

But there are other sources of PAHs: spilled gasoline, cigarette smoke, and lawn mower exhaust.

I added the lawn mower exhaust as an example to show the linkages between naturally occurring PAHs (cut grass) and PAHs that are air pollution (lawn mower exhaust). At low levels, PAHs let us experience one of the five human senses… smell. On the other hand, in larger quantities, many PAHs are poisonous.

Each chemical that can be called a PAH is different, but taken as a whole, they can be very toxic. The very first chemical found to be a carcinogen was a PAH, it was benzo(a)pyrene (one of the many chemicals added to cigarettes).

While some PAHs can cause cancer, others have been linked to childhood asthma and low IQ after pre-natal exposure.

One common source of PAHs is something we don't think about – lawn mowers. If you hate mowing the lawn, here's one more reason to consider planting a vegetable garden instead.

A 2001 study in Sweden found that using a typical push lawn mower (four-stroke, four horsepower) for one hour, emits the same PAHs as driving a car for 93 miles.

The Outdoor Power Equipment Institute estimates that a lawn mower is used 25 hours per year.

Just to see how far that would be, I pulled up Google Maps and started entering far away cities. Anchorage, Alaska was a little too near; Fairbanks, Alaska was a little too far.

Mexico City, Mexico! That's right. With an average lawn mowing season, the PAH emissions of one lawn mower would equal a multi-day road trip to the capital of Mexico from Odanah, Wisconsin.

An estimated 54 million Americans mow their lawn every week. If all 54 million Americans mowed their lawn four times in July, that would equal the PAHs of one car driving around the Earth (at the equator) over 800,000 times. Around, around, and around!

The ambient air monitoring station in Odanah measured slightly higher ozone in 2012 than in the previous two years. While it is not a drastic rise, any rise is unfortunate. Since ozone monitoring began in 2004, ozone levels have stayed relatively consistent.

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Mowing Down Air Quality: Effects of PAHs

(Continued from page 10)

By Nathan Kilger- Air Quality Specialist

Car and truck exhaust, lawn mowers, and spilled gasoline all contribute to ozone formation.

In a perfect world, we would like to see ozone levels decrease. Who knew getting out of mowing the lawn can help make a difference!

Things you can do to reduce impacts from lawn mowers:

1. Cut back on the amount of lawn you mow, does it all have to be kept short?
2. Convert some grass to vegetable or flower gardens, native prairies attract butterflies, bees, and birds.
3. Try to reduce gasoline spillage by using a funnel or fuel container with a spout.
4. Avoid mowing the lawn on the hot, sunny days when there is very little wind (for the sake of your health too!)

If you have any questions please contact Nathan Kilger, the Air Quality Specialist, at 715-682-7123 or email at Airquality@badriver-nsn.gov.

Radon…Why Should You Test?

By Daniel Wiggins– Air Quality Technician

The Bad River Tribal Indoor Radon Program is going into its eighth year of providing radon expertise, education, and services to the Bad River Tribal community. As many may know radon is undetectable by human senses, which testing is the only way to know if you have high indoor radon concentrations. Radon is also a known carcinogen which means that it is a known lung cancer causing agent. Many homeowners are aware of the health effect of radon; however, are still overlooking the importance of testing your home. I have heard homeowners even recommend to others not to test their home; otherwise you will be paying for it. Basically radon is not worth testing for and will only take money out of your pocket to reduce it.

Well is it worth it? Will you really get cancer? If radon is naturally occurring in the air...why fix it?

These are all valid questions that I have heard since becoming the Radon Program Manager and there may not be a simple answer to every question out there. However, through human observations and multiple cohort studies, radon is considered a potent environmental carcinogen, or a naturally occurring cancer causing agent.

The EPA has suggested that approximately 21,000 American deaths are directly related to radon each year, and in addition, is the second leading cause of lung cancer, behind tobacco smoke. The EPA has also estimated that 1 out of every 15 homes have levels over the EPA's action level, which is 4 picocurie liters or pCi/L (U.S. EPA, 2003*). Not surprising, is people who smoke are at even higher risk. Additional studies have suggested that a person living in 4 pCi/L, and who smoke, 29 out of every 1,000 people are at risk of developing lung cancer, compared to those who have never smoked, which only 2 out of every 1,000 are considered at risk (U.S. EPA, 2003*). As radon levels may increase in similar conditions, so does the probability of developing lung cancer (U.S. EPA, 2003*).

CanSAR (**Can**cer **S**urvivors **A**gainst **R**adon) has addressed these questions in a different manner and has been one of the lead organizations to bring social awareness to prevent radon-induced lung cancer through the power of videos, photos, and personal stories. These personal testaments, although can be very emotional to listen to and read, are actual cases of lung cancer that were traced back to high levels of radon in their homes. Many of these people were also nonsmokers who were unaware and/or uneducated of the dangerous and possibly deadly effects of radon. CanSAR has given a voice to the many people who have developed lung cancer due to radon. Survivor's and other's stories can be found at http://www.cansar.org/.

It is very important to test your home, it is the only way to know and it is quite easy and inexpensive. The Bad River Tribal Indoor Radon program provides radon expertise and radon measurement services at no cost to Tribal members.

Tribal Radon Website: http://www.badriver-nsn.gov/natural-resources/nrd/national-radon-action-month. If you have any questions please contact Daniel Wiggins, the Air Quality Technician, at 715-682-7123/ext. 1553 or email at Air1@badriver-nsn.gov.

**These and more facts can be found in the: June 2003, EPA Assessment of Risks from Radon in Homes, EPA -402-R-03-0003*

Madeline Island: A Traditional Cultural Property

By Edith Leoso-Tribal Historic Preservation Office

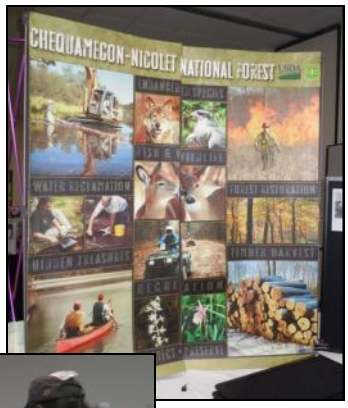
Although the Lake Superior Chippewa Tribes in the U.S. and Canada have always viewed Madeline Island as a *Sacred Place*, the Army Corp of Engineers has finally realized that it is! However, that realization came through much persuasion by the THPO's of the Lake Superior Chippewa Tribes in Wisconsin, Michigan and Minnesota. On April 4th, another consultation meeting will take place in Bayfield as the Army Corp of Engineers consults once again with THPO's on the importance of Madeline Island to Anishinabeg. The Army Corp is working with the THPO's to attempt to list Madeline Island as a *Traditional Cultural Property* in the National Register of Historic Places. Although all other Islands in the Apostle Islands chain are listed in the National Register as being part of the National Lake Shore, Madeline Island is not, and is not afforded many preservation opportunities. So far, some questions have been raised by the Wisconsin SHPO's office as to the legitimacy of claiming it as a "Traditional Cultural Property". The THPO's will be addressing the SHPO's questions and more, during the meeting in Bayfield. Also on the agenda for the Bayfield meeting is an overview of construction projects that are being proposed on Madeline Island that are subject to the permit process by the Army Corp, which includes THPO Review under Section 106 of the National Historic Preservation Act.

Aaniin ezhiwebak THPO Office!

The THPO Office is busy as usual and this Ziigwaan we will be helping in the development of an ANA Language Preservation and Maintenance Grant. The grant is expected to increase the Tribe's capacity to address the long-term goal of bringing back Ojibwemowin to the Bad River Community within 50 years. Our Lake Superior Dialect of Ojibwemowin began to wane about 40 years ago, and today there are only a handful of Lake Superior Dialect Speakers in Minnesota, Wisconsin and Michigan. Sadly, without help, we may see it become a dead language within 1-2 generations. The ANA Grant will include, among other tasks, working with expectant parents to build up their language capacity so that they can speak to their expecting and/or newborn child in the womb, at birth, and throughout their childhood. The reason for this is to once again have Ojibwemowin first language speakers living in Odanah. However, this will hardly work if that 1st language child doesn't have anyone else to converse with, and for that reason, we hope to build up the Ojibwe language capacity of the entire community to a conversational level, beginning with the children ages 0-4. Bad River Head Start children seem to retain much more of the Ojibwe language than the average adult can. If you have any questions please contact Edith Leoso at 715-682-7123, ext. 1662 or email at THPO@badriver-nsn.gov.

2013 Environmental Open House

Chi-migwech (Big Thanks) to all those who participated in our biennial Environmental Open House! We had 26 programs, departments, and organizations represented and over 130 attendees. One of the goals of the Open House is to provide a fun environment for the local community to ask questions of, comment on, and learn of the many programs, departments, and agencies that provide local services towards protecting and preserving the environment for future generations. Beautiful crafts and artwork were provided by April Stonedahl, Derek Nelis, Hillary 'Juni' Butler, and Ed Wiggins (*Pictured above is Ed Wiggins's artwork*). We would also like to further thank Juni Butler, Lloyd Hartwell, and anyone we may have forgot for their thoughtful donations.



(Top left) U.S. Department of the Interior– Bureau of Indian Affairs' display; (Top right) Chequamegon Nicolet National Forest 's display; (Middle) Bad River Air Office staff handing out info.; (Bottom left) Wardens & community members viewing some of the many display tables that attended the Open House; (Bottom right) Bad River THPO's display table

Radon Action Month

By Daniel Wiggins-AQT

The EPA has designated January as National Radon Action Month (RAM) to further encourage people to learn about radon and send a clear message to every person on the importance of testing their homes. The Tribal Indoor Radon Program sponsored two events for this years RAM: a coloring contest for 5-7 year olds and a poster contest for 8-14 year olds. A winner was chosen for each contest, which the winner of the coloring contest won a bike and the winner of the poster contest won a electric scooter. Both contests had great entries, and it is always unfortunate to have to chose winner…they all looked great! Here are the winners of this year's RAM contests. *Special thanks goes to all those that helped, including: the Boys & Girls Club, Birch Hill Community House and all the contestants.*

Coloring Contest Winner:
(Payton Bressette, 1st Grade)

Poster Contest Winner:
(Jamal Avey, 5th Grade)

Who's New?

John J. Prohaska– Brownfields Coordinator

My name is John Prohaska and I was recently hired as the Brownfields Coordinator for the department. Most people don't recognize what a brownfield is, so for those who don't, a *brownfield is any property potentially contaminated, previously contaminated, or perceived by a community to be contaminated with hazardous substances.*

In this position I will be developing an Environmental Response Program which will address environmental ordinance needs, public outreach, and site specific assessments and cleanups of impaired properties.

Here are a few highlights from my background:

- I was raised on a small resort outside of Rhinelander, Wisconsin, on Pelican Lake. A sign on the lake said "home of the musky" but I only caught about 7 muskies in my lifetime! But I enjoyed fishing for everything else.
- I attended several state and private colleges for 8 years and studied computer science, psychology and environmental studies with a heavy emphasis in environmental chemistry. I changed my major several times, so I attended several colleges before I chose environmental chemistry and graduated from Northland College in 1990.
- I worked for the Wisconsin Department of Natural Resources (WDNR) as Fisheries Technician in the fisheries research program working on projects for predator/prey manipulation and musky projects in the northwest district.
- I worked with WDNR in the Solid Waste Program as a project manager working on environmental repair programs and leaking underground storage tank site remediation
- I worked with WDNR in Black River Falls as a Hazardous Waste Specialist conducting inspections of hazardous waste generating sites, mostly large manufacturing facilities.
- With WDNR, I was also a Drinking Water and Groundwater Specialist conducting Safe Drinking Water Act (SDWA) compliance for public businesses and municipalities. I served on the northern region's closeout committee for remediated sites. I also worked in the private water section as a lead inspector for the well driller surveillance program.
- I have a number of outside interests: I am a firefighter on a volunteer department and acted as fire chief for the town of Highland for 4 years. I am also licensed as an emergency medical technician (EMT) on my local service.

If you have any questions I am located in the Reality Office, next to the Main Bad River NRD Office in the Chief Blackbird Center, and you are able to contact me at 715-682-7123, ext. 1587 or email at Brownfields@badriver-nsn.gov.

Patrick Mayotte– ANA Grant Administrator

Hello, my name is Patrick Mayotte and I've recently been hired as the Administration for Native Americans (ANA) Grant Administrator. This is a three year grant project and we'll be working towards implementation of our Bad River Tribe's water quality standards at cultural sites. Although I have just recently started as the ANA Grant Administrator, I'm really not that new to the Bad River Natural Resources, having previously worked here as the Cultural Research Preservation Project Coordinator from November, 2010 to December, 2011 and as the Historic Research Project Coordinator from November, 2008 until January, 2010. Both of these positions were at the Tribal Historic Preservation Office. It's great to be back at the Bad River Natural Resources working with all of our dedicated staff that cares about our quality of life and a healthy environment. I am now located within the Main-Bad River NRD Office, in the Chief Blackbird Center, and can be reached at 715-682-7123, ext. 1560 or email at ANAGrant@badriver-nsn.gov.

Keeping Things Moving:
Additional NRD Programs

Watch Out, High Capacity Fiber Optics Coming Through!

By Edith Leoso– THPO

This Ziigwaan the THPO Office will contract Tribal Monitors to monitor ground disturbance during the underground installation of a high capacity fiber optic line through the reservation. The fiber optic line will only be installed underground in certain places of the reservation. A large part of the installation will take place above ground and will run through the reservation on existing utility poles. This project is known as the "Merit Network's Reach 3MC Project". This project was developed in large part under the American Recovery and Reinvestment Act (ARRA) through grants awarded to Merit Network, Inc. The fiber optic line runs throughout the State of Michigan and will continue through to Duluth, Minnesota. Another line may run from Duluth to the city of Eau Claire, linking the southern end of Wisconsin. More information regarding this project can be found at the URL: http://www.merit.edu/meritformichigan/. The Tribe is currently making plans to utilize this new resource throughout the reservation.

What's the ANA Environmental Regulatory Enhancement Grant?

By Patrick Mayotte, ANA Grant Administrator

The Bad River Band was awarded an Administration for Native Americans (ANA) grant for implementing water quality standards at cultural sites. This grant will be a three year, three-phase project. Phase 1 of the ANA grant will focus on establishing identification of cultural sites. We'll look at the past history, current cultural uses, and how and where our people use their environment. This will be an integrated project that will incorporate anthropology through a review of the prehistory up to the 20th century, and participatory geography through interviews and field trips to designated cultural sites which will allow us to document current uses of these areas. Paleoecology and toxicity study by use of sediment core sampling will further give us a view of what the environment consisted of before European settlement and after the modern industrial life brought changes to the various waterways and lakes.

What this means is factors, such as community input, will be vital to this project's goals. We'll be seeking individuals that are knowledgeable and willing to invest their knowledge for the future of our people, our waters and the health of our environment. If you, or someone you know, has cultural knowledge to share with us concerning cultural sites, or past use, of the Reservation waters at cultural sites, I can be contacted at the Bad River Natural Resources Department, at 715-682-7123 x 1560 or email at anagrant@badriver-nsn.gov.

Piping Plover Project

By John Patrick-Conservation Warden

Bad River Conservation Officers will be providing assistance to Bad River Wildlife management during the 2013 Piping Plover project on Long Island. The project will begin Mid-May and will last thru July. The season is dependent on weather conditions, which affect the plover's population and chick development. ***All dog owners who plan on bringing their dog to Long Island need to remember there is a 'Leash Ordinance' that will continue to be enforced!*** "Plover Monitors" and equipment will be transported back and forth to Long Island for the Plover season. Please respect the "Plover Monitors" as they will be putting in long hours to aid in assisting the survival of this endangered species.

Quick Note from the Warden

By John Patrick– Conservation Warden

Fishing Season: Remember to have your boat registered with the Bad River Natural Resource Department before launching your boat this season. You can register by stopping by the Bad River Natural Resource Department and ask the receptionist for registration instructions. **Remember that taking your boat off the reservation for use on inland lakes will require you to have Wisconsin state registration**. Be sure you plan ahead and check before you leave. *Be responsible and practice safety! Make sure there are life preservers for all passengers on board!*

BAD RIVER NATURAL RESOURCES

Bad River Natural Resource Department
Chief Blackbird Center
72682 Maple Street
Odanah, WI 54861

Phone: 715-682-7123
Fax: 715-682-7118

We're On The WEB!
Www.badriver-nsn.gov

View of Western Penokee Hills from Eagle's Peak (just west of Mt. Wittlesey)

Photo taken by Cyrus Hester

Monitoring Plan for Coastal Waters

Public Input Opportunity

A public meeting will be held on Tuesday, April 30th at 5:00 pm
Bad River Casino Convention Center

The Bad River Natural Resources Department (BRNRD) is soliciting comments on its BEACH project, specifically on the:

- Evaluation and classification process used to rank tribal beaches;
- Sampling design and monitoring plan to assess coastal recreation waters in 2013.

Written comments can be submitted to:

Naomi Tillison, BRNRD

P.O. Box 39, Odanah, WI 54861 or wqs@badriver-nsn.gov.

Comment deadline is April 30, 2013.

More information is provided in the Tribal Library, the BRNRD office, and on the Tribe's website at http://badriver-nsn.gov/home.

Posted as of:
3/28/13

-MISSION STATEMENT-

The Department strives for resource management which both conserves the natural resources for the future generations and provide for the needs of the present. The departments existence reflects the importance the Bad River Tribe places on its right and ability to exercise sovereignty, self-determination and self-regulation in the area of natural resource management.